October 2000 Revision A

TEST-ALL II® Plus with TDR

User's Manual

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1. INTRODUCTION TO THE TEST-ALL® IV+Plus with TDR

(The TEST-ALL® IV+Plus with TDR will be referred to as the TEST-ALL® throughout the rest of this user's manual.)

The TEST-ALL® IV+Plus is a completely automatic four-pair cable tester that can per complete test of a single 4-pair cable in approximately three seconds. The test res in several different test result screens and can be stored in memory for later retrie

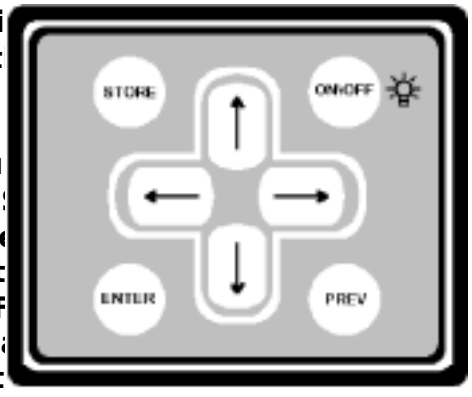
The TEST-ALL® IV+Plus continually performs a test to detect a live line (power on an conductors). It detects opens, shorts, reversals, crosses and split pairs. It also can wiremap configuration on the workstation end of the cable and perform length test term 'workstation' will be referred to as 'station' throughout the rest of this user's

The TEST-ALL® IV+Plus system features a test set and a programmable terminator w connection to opposite ends of the cable being tested. This system can be configu either the closet end or the station end. This system is also capable of testing pat units establish a communications link if any two conductors have continuity from t the station end of the cable. Once communication is established, testing is perfor

The TEST-ALL® IV+Plus can be used to test cable in all environments, such as a build plant, central office, etc. The kit includes necessary test cords, cables and adapter TEST-ALL® IV+Plus and Programmable Terminator to specific hardware under test, such as 6 and 110 blocks.

2. UNDERSTANDING THE TEST-ALL® IV+Plus

a) THE KEYPAD - The TEST-ALL® IV+Plus has ei keys on its front panel. A brief descript key's function is summarized below.



i) ON/OFF - The red ON/OFF key in theu corner of the front panel turns the TE +Plus on and off. The test set is turne press of the ON/OFF key. The test set off by pressing and holding the ON/OF seconds. The ON/OFF key also activates deactivates a backlight when the test backlight is denoted by a light symbol next to the ON/OFF key.

ii) STORE - The blue STORE key in the upper left corner of the front panel stores t test results only when in any of the test results screens.

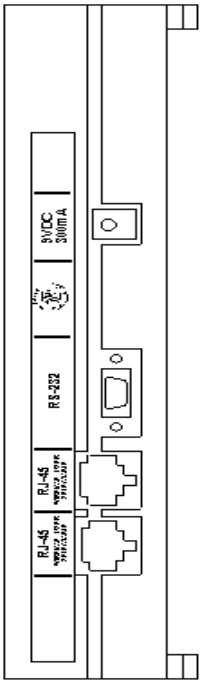
iii) ← or → - The blue ← or → keys in the middle of the front panel scroll through the MA MENU, TEST SETUP, TDR MENU, and all test results screens. These arrow keys used to move a blinking cursor left and right when editing text.

iv) ↑ and ↓ - The blue ↑ and ↓ keys in the middle of the front panel are used to scroll throu of items in any of the menu's. These arrow keys are also used to scroll throug when editing text.

v) ENTER - The blue ENTER key in the bottom left corner of the front panel selects from a list. This key is also used to enter edited text into a field.

vi) PREV - The blue PREV key in the bottom right corner of the front panel returns menu. This key is also used to cancel a change when editing text.

b) THE INTERFACE - The side panel of the TEST-ALL IV® +Plus opposite the handle, contains the test interface along with the serial port and external power source j



i) RJ45 - Two identical RJ45 jacks allow RJ45 cables to be plugged di into the TEST-ALL® IV® +Plus. Tests can also be performed using a fou pair RJ45 test cord, in conjunction with RJ45 equipped universal (adapters and RJ45 equipped 110 hardware adapters. (RJ45 equip are also available for BIX and other hardware).

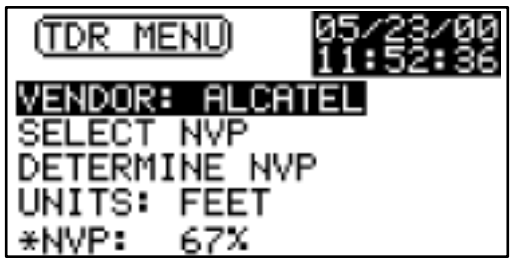
ii) RS-232 - A 9-pin D-Sub connector in conjunction with a 9-pin Seri is used for serial communications between a PC and® the TEST-ALL +Plus. The RS-232 port is used for field upgrading® the TEST-ALL +Plus and when uploading stored records to a host PC.

iii) 9VDC/300mA - The AC adapter provided with the kit, can be plug this jack when feasible. This eliminates battery drain, prolongin of the batteries.

c) POWER-UP The TEST-ALL IV® +Plus displays a startup screen when powering up. Thi screen is displayed for three seconds while the test set performs a self-diagnosti that all internal components are operating properly. The test set will display one MAIN MENU, TEST SETUP, TDR MENU or one of three test results screens, includi FAIL, DETAILED TEXT and CABLE VIEW. The screen selected prior to the last powe will be displayed after the start-up screen on the next power-up. If one of these not selected prior to the last power-down, the default screen, MAIN MENU, will t displayed. The following are the six screens in order as they are accessed using

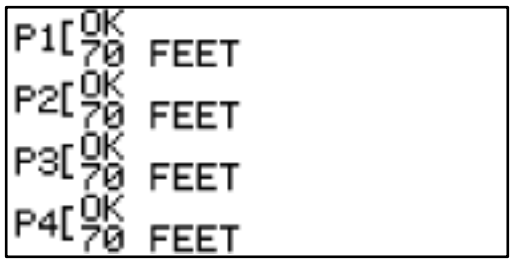
1) MAIN MENU

2) TEST SETUP

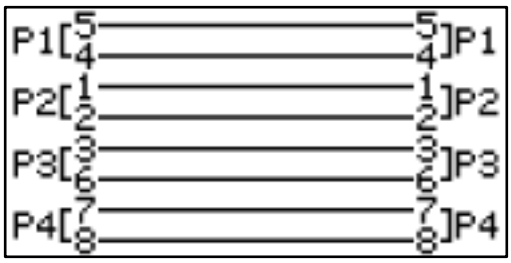


3) TDR MENU

4) PASS/FAIL



5) DETAILED TEXT



6) CABLE VIEW

d) DETECTING A LIVE LINE - The TEST-ALL IV® +Plus detects AC and DC voltage levels exceeding 10V. If a voltage exceeding 10V is present on any two conductors, the TEST-ALL IV® +Plus will display the message "VOLTAGE PRESENT!! REMOVE IMMEDIATELY!". If this condition exists while testing, the unit will immediately stop testing until the voltage is removed from the line or until the TEST-ALL IV® +Plus is disconnected.

NOTE: DISCONNECT THE TEST-ALL IV® +Plus IMMEDIATELY IF A LIVE LINE IS DETECTED.

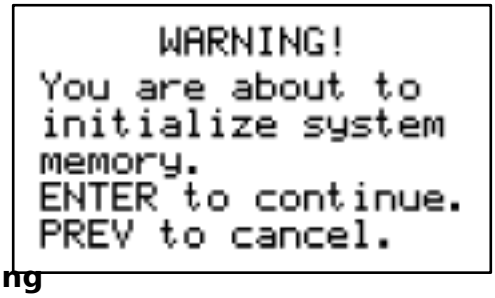
e) CONTRAST AND SYSTEM INITIALIZATION - If the display contrast is too dark or too light when powered up, or if the unit is suddenly powering down, or for any other problems that may exist with the TEST-ALL IV® +Plus, a 3-key sequence should be applied on power-up. This key sequence will repair most problems that may exist with the unit.

i) For display contrast problems:

- **With the TEST-ALL IV® +Plus off, press the 'ON/OFF' key while holding the <enter> keys. This key sequence should be held very briefly. This will power the unit and the contrast setting will be reset to its default setting. This should provide better viewing of different screens.**

ii) For any other problems:

- **With the TEST-ALL IV® +Plus off, press the 'ON/OFF' key while holding the <enter> and <prev> keys. This key sequence should be held until the following screen, as shown, is displayed.**



- **Pressing the 'ENTER' key will automatically initialize the system memory. This is not recommended if the unit is operating properly, since all stored sites and records will be deleted and the system set to the defaulted. Pressing the 'PREV' key will skip the initialization. Normal operation will proceed for both cases.**

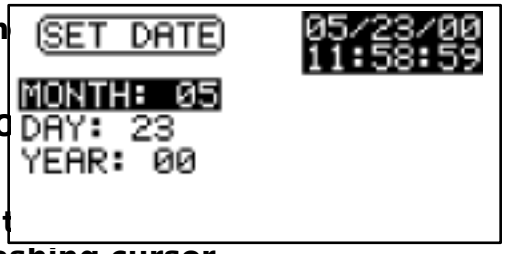
3. SETTING UP THE TEST-ALL IV® +Plus

a) SETTING THE DATE

i) From the MAIN MENU, use the ↑ and ↓ to highlig
SYSTEM SETUP.

ii) Press the 'ENTER' key. A menu nam
SETUP will be displayed as shown.

iii) From the SYSTEM SETUP menu, use the ↑ and ↓ to highlight SET DATE.



iv) Press the 'ENTER' key. A menu nam
DATE will be displayed as shown.

v) Highlight any of the three items, MO
or YEAR using the ↑ and ↓.

vi) Press the 'ENTER' key. The digit of t
selected will begin flashing. The flashing cursor
denotes editing text mode.

vii) Use the ↑ and ↓ to scroll through a list of possible entry's for that item. Notice tha
clock reflects a change to that item.

viii) Once the entry is found, press the 'ENTER' key again. This enters the text into

ix) The following are possible entry's for each item in the SET DATE menu.
- MONTH - 01 to 12
- DAY 01 to 31 for Jan, March, May, July, Aug, Oct, Dec
  01 to 30 for April, June, Sept, Nov
  01 to 29 for Feb on leap years
  01 to 28 for Feb on non-leap years
- YEAR - 00 to 99 (Y2K capable)

x) Press the 'PREV' key twice to move back to the MAIN MENU.

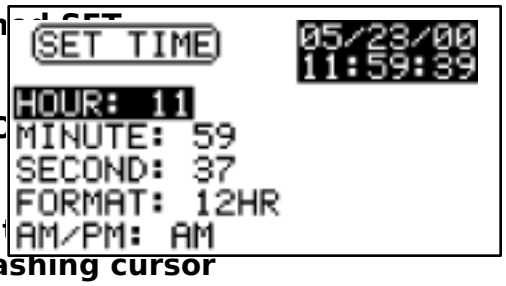
b) SETTING THE TIME

i) From the MAIN MENU, use the ↑ and ↓ to highlight SYSTEM SETUP.

ii) Press the 'ENTER' key. A menu named SYSTEM SETUP will be displayed.

iii) From the SYSTEM SETUP menu, use the ↑ and ↓ to highlight SET TIME.

iv) Press the 'ENTER' key. A menu nam[illegible] SET TIME will be displayed as shown.



v) Highlight any of the three items, HO[illegible] or SECOND using the ↑ and ↓.

vi) Press the 'ENTER' key. The digit of [illegible] selected will begin flashing. The flashing cursor denotes editing text mode.

vii) Use the ↑ and ↓ to scroll through a list of possible entry's for that item. Notice that clock reflects a change to that item.

viii) Once an entry is found, press the 'ENTER' key again. This enters the text into

ix) The last two items in the SET TIME menu, FORMAT and AM/PM, have two entry' toggled back and forth using the 'ENTER' key.

x) The following are possible entry's for each item in the SET TIME menu.
- HOUR - 01 to 12 for 12 HR format; 00 to 23 for 24 HR format.
- MINUTE - 00 to 59
- SECOND - 00 to 59
- FORMAT - 12HR or 24 HR
- AM/PM - AM or PM

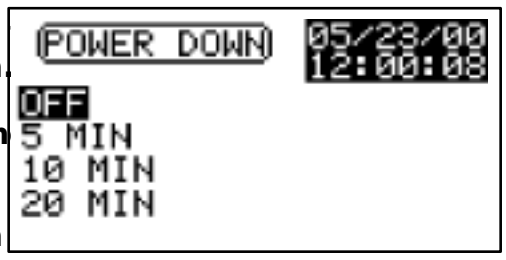
xi) Press the 'PREV' key twice to move back to the MAIN MENU.

c) SETTING THE AUTO-POWER DOWN TIMER - The AUTO-POWER DOWN TIMER is used to automatically shut the TEST-ALL IV® [illegible] OFF. This feature can be enabled using on[illegible] of three timed intervals: 5 min., 10 min. or 20 min. This feature can also be disa[illegible]

i) From the Main Menu, use the ↑ and ↓ to highlight SYSTEM SETUP.

ii) Press the 'ENTER' key. A menu named SYSTEM SETUP will be displayed.

iii) From the SYSTEM SETUP menu, use ↑ and ↓ to highlight the POWER DOWN item.



iv) Press the 'ENTER' key. A menu nam[illegible] DOWN will be displayed as shown.

v) Highlight an item of choice listed in [illegible] DOWN menu using the ↑ and ↓.

vi) Press the 'ENTER' key. The SYSTEM SETUP menu will then be displayed. Notic POWER DOWN now contains the item selected.

vii) Press the 'PREV' key to move back to the MAIN MENU.

d) ENABLING AND DISABLING THE BEEPER - The beeper, when enabled, will emit a tone whenever certain conditions are met. Such conditions include power-up, selecti the menu, returning to a previous menu and entering data.

i) From the MAIN MENU, use the ↑ and ↓ to highlight SYSTEM SETUP.

ii) Press the 'ENTER' key. A menu named SYSTEM SETUP will be displayed.

iii) From the SYSTEM SETUP menu, use the ↑ and ↓ to highlight the BEEP item.

iv) Press the 'ENTER' key. Notice the item changes from BEEP-ON to BEEP-OFF.

v) Press the 'ENTER' key again. Notice that the item changes back.

vi) The beeper state is stored in non-volatile memory, which keeps it in the same power down.

vii) Press the 'PREV' key once to move back to the MAIN MENU.

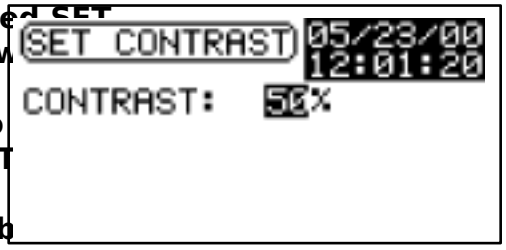
e) SETTING THE CONTRAST - The contrast may need to be adjusted depending on operating temperatures.

i) From the MAIN MENU, use the ↑ **and ↓ to highlight SYSTEM SETUP.**

ii) Press the 'ENTER' key. A menu named SYSTEM SETUP will be displayed.

iii) From the SYSTEM SETUP menu, use the ↑ and ↓ to highlight the SET CONTRAST item.

iv) Press the 'ENTER' key. A menu named SET CONTRAST will be displayed as show



v) Use the ↑ and ↓ to adjust the contrast to desirable setting and press the 'ENT

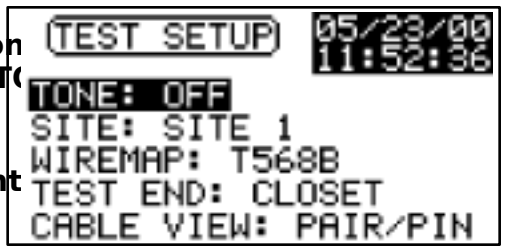
vi) Press the 'PREV' key once to move b MAIN MENU.

4. TEST-ALL IV® +Plus TEST SET-UP

a) ENABLING AND DISABLING A LOCATING TONE The TEST-ALL IV® +Plus contains a warble tone which may be used to trace and identify cables. The following are in using the tone function.

i) Highlight the TONE item in the TEST SETUP menu using the ↑ and ↓ keys.

ii) Press the 'ENTER' key to turn the ton Notice that the item changes from T to TONE-ON.



iii) Use an inductive probe or equivalent tone on the cable under test.

iv) Tone can only be generated while in the TEST SETUP menu. Once exited, the t immediately turn off.

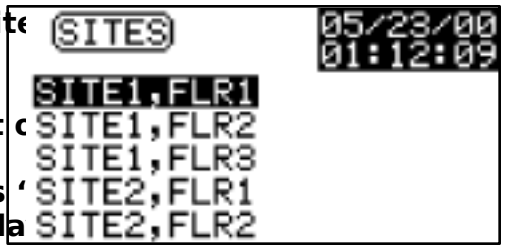
v) Pressing the 'ENTER' key a second time turns the tone off.

NOTE: A WIREMAP MUST BE SELECTED FOR THIS FEATURE SINCE THE TONE IS GENERATED ON EACH PAIR. IF IN AUTOMAP MODE, THE TEST-ALL IV® +Plus WILL DEFAULT TO THE T568B WIREMAP PAIRING.

b) SELECTING A CURRENT SITE All records stored will be stored under the currently selected site. The following instructions are given for changing the current site.

i) Highlight the SITE item in TEST SETUP menu using the ↑ and ↓ keys.

ii) Press the ENTER key and a list of site displayed similar to that shown.



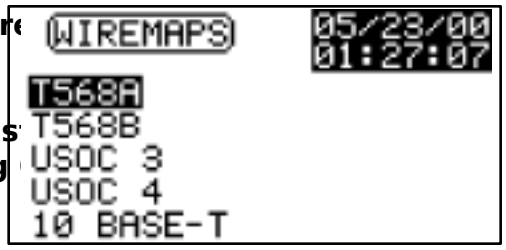
iii) Use the ↑ and ↓ to scroll through the list o

iv) Highlight the desired site and press ' TEST SETUP menu will then be displa showing the selected site.

c) SELECTING A STATION WIREMAP This is the wire configuration on the station end of cable. Refer to Appendix B for wire mappings. The following are instructions fo wiremap.

i) Highlight the WIREMAP item in the TEST SETUP menu.

ii) Press the ENTER key and a list of wir
be displayed as shown.



iii) Use the ↑ and ↓ to scroll through the lis
wiremaps. One of 7 items including
and AUTOMAP can be selected.

iv) Highlight the desired wiremap and press
'ENTER.' The TEST SETUP menu will then be displayed showing the selected wi

NOTE: PUT THE UNIT INTO AUTOMAP MODE TO AUTOMATICALLY DETECT THE STATION END WIREMAP.

d) SELECTING THE TEST SET END: This is the end the TEST-ALL IV+ performs its tests from. This can be either CLOSET or STATION. Selection of the TEST END is

i) Highlight the TEST END item in the TEST SETUP menu using the ↑ and ↓ keys

ii) Press the ENTER key to change the test end. Notice that the item changes to e
END: CLOSET' or 'TEST END: STATION'.

iii) Press the 'ENTER' key again to change it back.

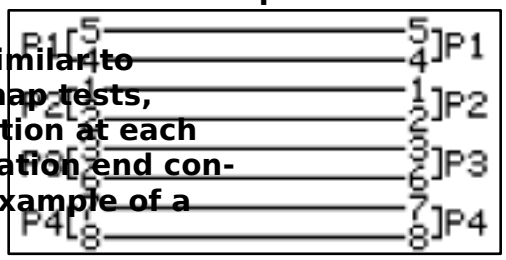
e) SELECTING A CABLE VIEW: The CABLE VIEW test results screens are a graphical representation of the wiring from the closet end to the station end, and can be d different perspectives. The following are instructions for selecting a CABLE VIEW

i) Highlight the CABLE VIEW item in the TEST SETUP menu using the ↑ and ↓ keys

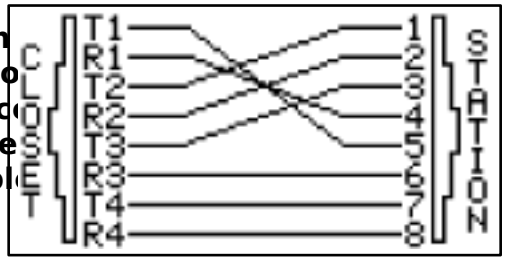
ii) Press the 'ENTER' key. Notice the item changes to either 'CABLE VIEW: PAIR/PI
'CABLE VIEW: BLCK/JCK'.

iii) Press the 'ENTER' key again to change it back.

iv) The following are CABLE VIEW options and a description of each.



- **PAIR/PIN - This representation is similar to the TSB67 specification for wiremap tests, which verifies pair to pin termination at each end. Look at the closet end to station end connections. Notice that this is an example of a T568B wiremap wired correctly.**



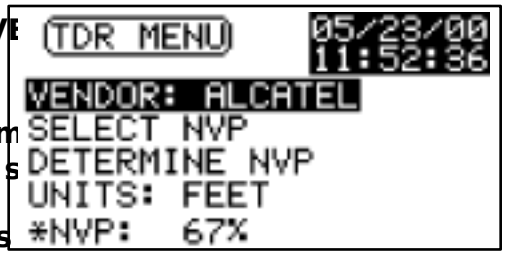
- **BLCK/JCK - This is a representation closet end viewed as a vertical blo station end is viewed as an RJ45 c Look at the closet end to station e Notice that this is another exampl wiremap wired correctly.**

NOTE: WHEN TESTING PATCH CORDS, IT IS SUGGESTED TO USE THE PAIR/PIN CABLE VIEW SCREEN AND SELECT T568B AS THE WIREMAP.

5. TIME DOMAIN REFLECTOMETRY (TDR) SETUP

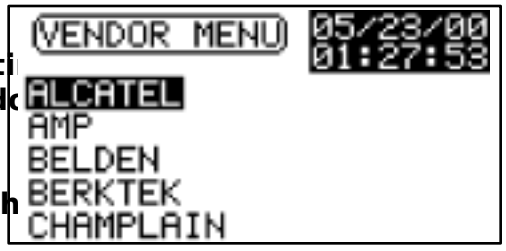
a) SELECTING A CABLE VENDOR'S NVP - If unknown NVP can be determined for the cab under test by selecting a cable vendor and category type. The NVP (Nominal Vel Propagation) is expressed as a percent of the speed of light. This is the velocity travel down a single pair, which is used for length measurements.

i) From the TDR MENU, highlight the VE item using the ↑ and ↓ keys.



ii) Press the 'ENTER' key. A screen nam VENDOR MENU will be displayed as s

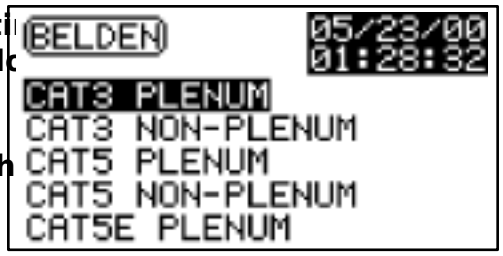
iii) From the VENDOR MENU, use the ↑ and ↓ keys to highlight a Vendor name.



iv) Press the "ENTER' key. A screen listi category types of the selected vend displayed as shown.

v) Use the ↑ and ↓ keys to scroll through th category types.

iv) Press the "ENTER' key. A screen listi
category types of the selected vendo
displayed as shown.

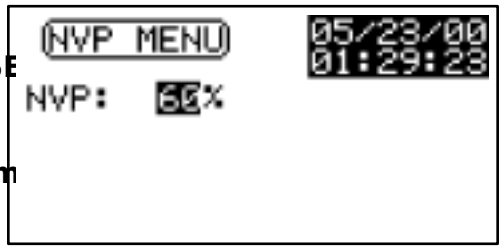


v) Use the ↑ and ↓ keys to scroll through th
category types.

vi) When the proper category type of cable being used
is highlighted, press the 'ENTER' key. The TDR MENU will be displayed showin
lected vendor and NVP for the category type of cable selected.

b) SELECTING AN NVP VALUE. This item allows the user to enter in an NVP value for th
to be tested.

i) From the TDR MENU, highlight the SE
NVP item using the ↑ and ↓ keys.



ii) Press the 'ENTER' key. A screen nam
MENU will be displayed as shown.

iii) Using the ↑ and ↓ keys, select the NVP of the cable to be tested.

iv) When the NVP of the cable to be tested is found, press the 'ENTER' key. The T
be displayed showing the NVP entered.

c) DETERMINING AN UNKNOWN NVP USING A CABLE SAMPLE

i) Physically measure the cable sample, using at least 15 meters or approximatel
longer lengths will provide greater accuracy in determining NVP. Maximum ca
determining NVP is 2,000 feet.

ii) From the TDR MENU, highlight the DE
NVP item using the ↑ and ↓ keys.

iii) Press the 'ENTER' key. A screen nam
DETERMN NVP will be displayed as sh

iv) Using the ↑ and ↓ keys, select the length of the cable sample.

v) When the length of the cable sample is found, press the 'ENTER' key. The TDR
displayed showing the determined NVP of the cable sample. Use this NVP valu
all length measurements on cable from the same spool.

NOTE: FOR BEST NVP ACCURACY, KEEP THE FAR END OF THE CABLE OPEN.

d) SELECTING A UNIT OF MEASURE: The unit of measure is the length units, feet or me that the TEST-ALL IV® +Plus uses to represent the length of the cable.

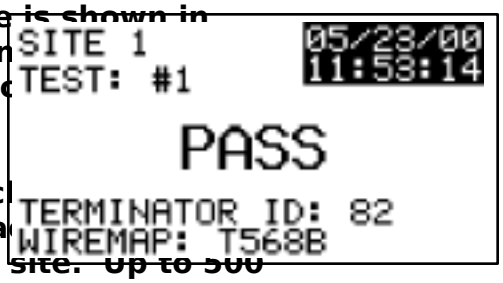
i) From the TDR MENU, highlight the UNITS item and press the ↑ and ↓ keys.

ii) Pressing the 'ENTER' key will toggle this item to FEET or METERS.

NOTE: ALL ITEMS SELECTED FROM THE TDR MENU ARE STORED IN MEMORY AND REMAIN THERE AFTER POWER DOWN.

6. UNDERSTANDING THE TEST RESULTS SCREENS

a) PASS/FAIL: This is the first of three test results screens. This screen contains info pertaining to the cable under test.



i) A clock containing the date and time is shown in the upper right corner of this screen to record the date and time each rec

ii) The site name SITE 1 in this case, is left corner. This can be up to a 12-c identifying the specific test site. Ea stored under the currently selected site. Up to 500 records can be stored across 20 different sites.

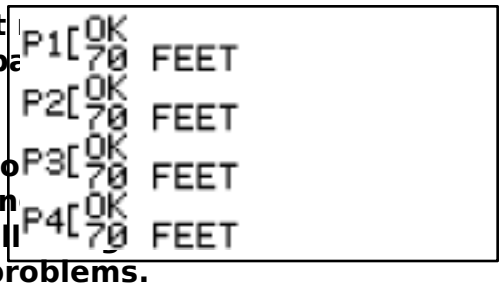
iii) Just below the site name is the test number, TEST #1, in this case. This numbe each time a test is stored. This number is stored along with the test results.

iv) In the middle of this screen is the actual test results of the currently tested ca correctly wired cable. FAIL is for a cable containing any continuity problems su reversals, crosses, and split pairs. '----' is displayed when a Programmable Ter

v) The TERMINATOR ID is the ID programmed into the terminator which is sent to TEST-ALL IV® +Plus.

vi) The WIREMAP is user selectable. This is the station end wire configuration eit the user or auto-detected by the test set. The wiremaps used by the TEST-ALL® +Plus are located in Appendix B, toward the back of this manual.

b) DETAILED TEXT - This is the second test screen, showing the results for each pa format.

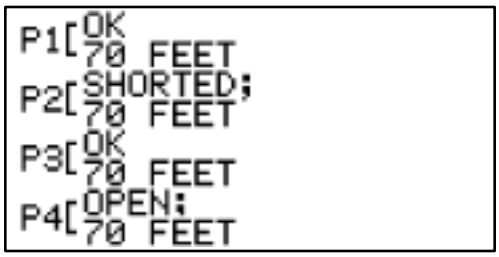


i) This screen describes in detail the co lems detected by the TEST-All® Valon with the length of each pair. The foll explanation of possible continuity problems.

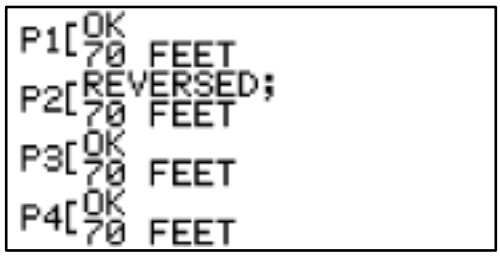
- **OK - Pair contains no continuity problems.**
- **OPEN - Tip and Ring of that pair are open.**
- **SHORTED - Tip and Ring of that pair are shorted.**
- **REVERSED - Tip and Ring of that pair are reversed.**
- **CROSSED - Pair is crossed with a second pair.**
- **SPLIT - Pair is split with a second pair.**
- **T OPEN - Tip of that pair is open.**
- **R OPEN - Ring of that pair is open.**
- **T SHORT - Tip of that pair is shorted.**
- **R SHORT - Ring of that pair is shorted to another conductor.**
- **T CROSS - Tip of that pair is crossed or transposed.**
- **R CROSS - Ring of that pair is crossed or transposed.**

NOTE: CONTINUITY TESTING CAN BE PERFORMED ON A CABLE UP TO 2 MILES IN LENGTH.

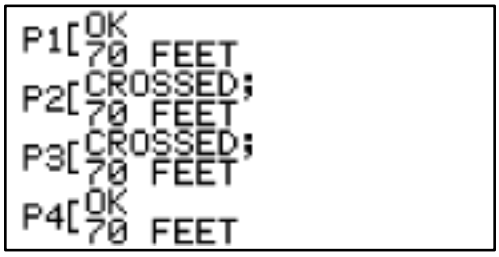
ii) The following are examples representing possible continuity problems.



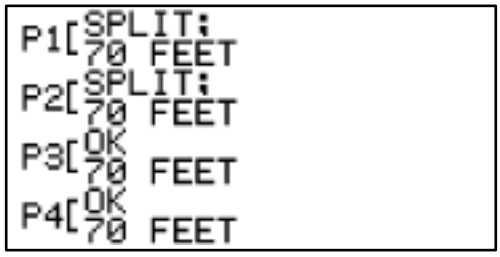
Pair 2 Shorted and Pair 4 Open.



Pair 2 Reversed.



Pairs 2 and 3 Crossed.

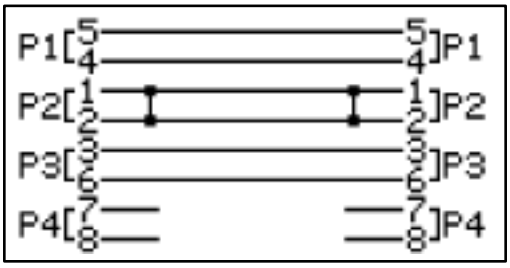


Pairs 1 and 2 Split

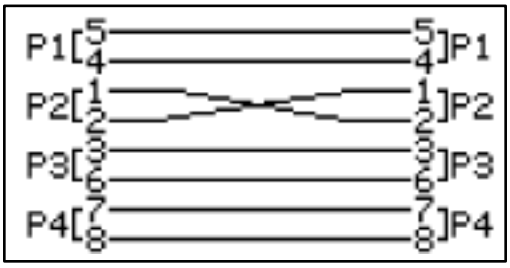
c) CABLE VIEW - This is the third test results screen. This screen is a graphical repre the wiring, which verifies pair to pin termination at each end of the cable. Two d PAIR/PIN or BLCK/JCK, can be selected. These perspectives are described below.

i) In the PAIR/PIN perspective, which is similar to the TSB67 specification, both si screen are labeled P1 through P4 (Pair 1 through Pair 4). Each pair is labeled with the proper pin numbers starting with TIP and then RING for that pair. If a basic lin tested, the left side of the screen represents the closet and the right side repr

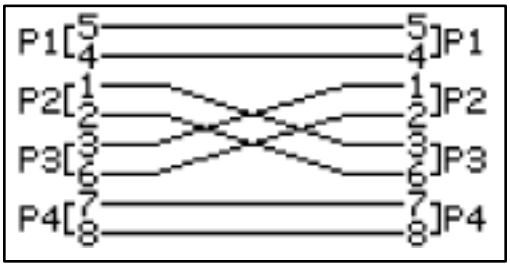
ii) The following are examples representing possible connectivity errors using the perspective, with a T568B wiremap on the station end of the cable.



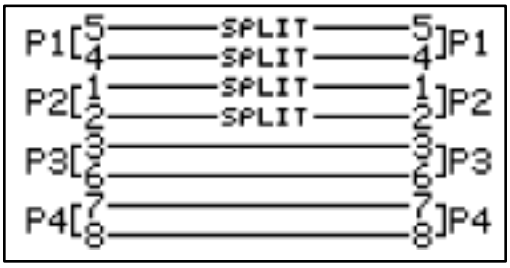
Pair 2 Shorted and Pair 4 Open.



Pair 2 Reversed.



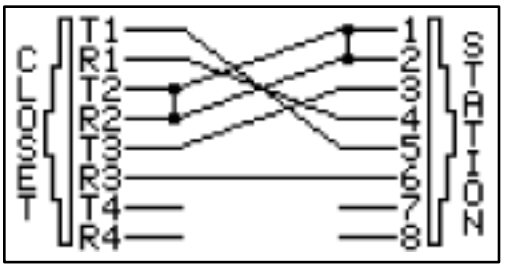
Pairs 2 and 3 Crossed.



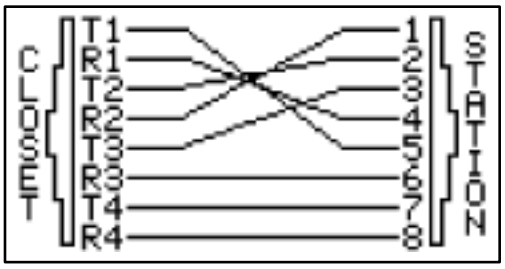
Pairs 1 and 2 Split.

iii) In the BLCK/JCK perspective, the left side of the screen is labeled T1, R1, T2, R and R4, which represents a 110 block. The right side of the screen is labeled S the pin numbers in order. This end represents an RJ45 jack.

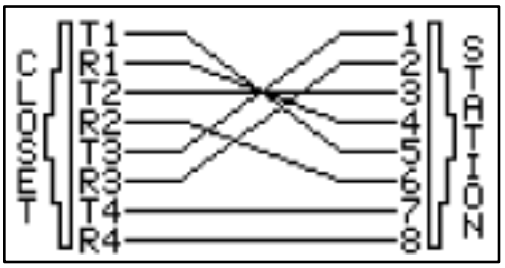
iv) The following are examples representing possible connectivity errors using the perspective, with a T568B wiremap on the station end of the cable.



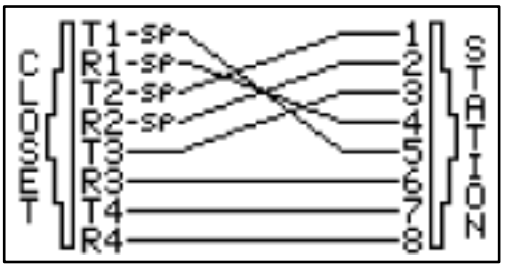
Pair 2 Shorted and Pair 4 Open.



Pair 2 Reversed.



Pairs 2 and 3 Crossed.



Pairs 1 and 2 Split.

NOTE: WHEN TESTING PATCH CORDS, IT IS SUGGESTED TO USE THE PAIR/PIN CABLE VIEW SCREEN AND SELECT T568B AS THE WIREMAP.

d) STORING TEST RESULTS - The test results can be stored into memory for later retrie following are instructions for storage of a single test.

i) Move to any one of the test results screens, PASS/FAIL, DETAILED TEXT or CABL

ii) Plug the TEST-ALL® I-V Plus into one end of the cable and the Programmable Term into the other end. Wait a few seconds for the test to complete.

iii) Press the 'STORE' key. The test results will automatically be stored into mem PASS/FAIL screen, notice that the test # is incremented.

iv) The following information is stored:

- SITE - Detailed place or location the test was performed.
- TEST# - Number of the record stored at a particular site. Up to 500 records ca
- TERMINATOR ID - Identification number sent from Programmable Terminator.
- WIREMAP - The wiremap selected or detected if AUTOMAP was used.
- DATE and TIME - Date and time test was performed.
- CONTINUITY PROBLEMS - Shorts, opens, crosses, reversals, split pairs and oth miswires detected by the TEST-ALL IV® +Plus.
- PAIR LENGTH - Length of each pair.

e) INTERROGATION OF THE PROGRAMMABLE TERMINATOR - Testing cables using the TEST-ALL IV® +Plus can be performed using one Programmable Terminator. Howev Programmable Terminators properly used can increase efficiency and decrease in The proper use of the TEST-ALL IV® +Plus system is as follows.

i) CLOSET END TESTING

- Take several Programmable Terminators, program each one to a different ID plug each one into different station jacks.

- The Programmable Terminator may be programmed based on a system of ide cable, i.e. if the jack is identified as 2069, program the Terminator to 69. T way to relate the Terminator ID to the cable under test.

- Once each Programmable Terminator is plugged into an individual jack, testi performed at the closet end of the cable.

- Make sure the TEST-ALL IV® +Plus is set up with CLOSET selected for the TEST END and the proper wiremap selected for that station's jack.

- Testing can then proceed.

ii) STATION END TESTING

- Take several Programmable Terminators, program each one to a different ID plug each one into the proper adapter hardware for the block being used in

- Again, use the same system of identifying the cable to program each Termin described in the CLOSET END TESTING Section.

- **Once each Programmable Terminator is plugged into an individual jack, testi performed at the station end of the cable.**
- **Make sure the TEST-ALL IV-Plus is set up with STATION selected for the TEST EN and the proper wiremap selected for that station's jack.**
- **Testing can then proceed.**

ii) THE BENEFIT OF STATION END TESTING - The benefit of testing from the station end is that the station or jack will only be visited once. When testing from the clos cable, each station or jack must be visited twice: once for plugging the Progra Terminator in and once for removing it from the jack. As one can see, station e increase efficiency by decreasing visits to a station jack.

iii) ELIMINATION OF SPECIAL ADAPTERS ON THE STATION END - The need for special adapters when testing on the station end of the cable is eliminated. St requires no special adapters, with the known selected or auto-detected station

7. USING THE TEST-ALL IV-Plus

a) SELECTING A CURRENT SITE - The selection of a site can be done in the RECORD MG menu, SITE MGMT menu or the TEST SETUP menu (See Section 4B). This examp RECORD MGMT menu.

i) From the MAIN MENU, use the ↑ and ↓ to high- light the RECORD MGMT item.

ii) Press the 'ENTER' key. A menu name MGMT will be displayed as shown.

iii) From the RECORD MGMT menu, use t ↑ and ↓ to highlight the SELECT SITE item.

iv) Press the 'ENTER' key and a list of sites will be displayed.

v) Use the ↑ and ↓ to scroll through the list of sites.

vi) Highlight the desired site and press 'ENTER.' The RECORD MGMT screen will th displayed showing the selected site.

vii) Press the 'PREV' key to move back to the MAIN MENU.

b) VIEWING A RECORD FROM A SITE

i) From the MAIN MENU, use ↑ and ↓ to highlight the RECORD MGMT item.

ii) Press the 'ENTER' key. A menu named RECORD MGMT will be displayed.

iii) From the RECORD MGMT menu, use ↑ and ↓ to highlight VIEW RECORD.

iv) Press the 'ENTER' key. A menu named VIEW RECORD will be displayed with a blinking cursor as shown.

v) Using the ↑ and ↓, select the record number to view and press 'ENTER.' The selected record will be displayed in the CABLE VIEW test results screen.

vi) From the CABLE VIEW test results screen, use ← or → to move through the different test results screens. The stored data from each test is used to rebuild each screen

vii) When finished viewing the record, press the 'PREV' key to move back to the V

viii) Press the 'PREV' key twice to move back to the MAIN MENU.

NOTE: IF THERE ARE NO RECORDS STORED UNDER THE CURRENT SITE, THE MESSAGE 'NO RECORDS FOUND' WILL BE DISPLAYED.

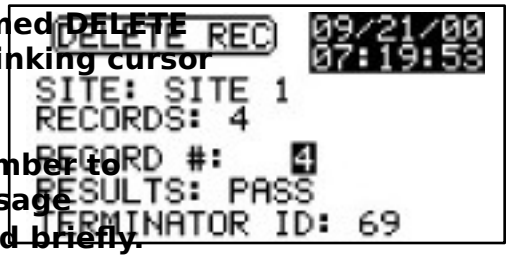
c) DELETING A RECORD FROM A SITE

i) From the MAIN MENU, use ↑ and ↓ to highlight the RECORD MGMT item.

ii) Press the 'ENTER' key. A menu named RECORD MGMT will be displayed.

iii) From the RECORD MGMT menu, use ↑ and ↓ to highlight DELETE RECORD.

iv) Press the 'ENTER' key. A menu named DELETE RECORD will be displayed with a blinking cursor as shown.



v) Using the ↑ and ↓, select the record number to delete and press 'ENTER.' The message 'RECORD DELETED' will be displayed briefly.

vi)Press 'PREV' twice to move back to MAIN MENU.

NOTE:IF THERE ARE NO RECORDS STORED UNDER THE CURRENT SITE, THE MESSAGE 'NO RECORDS FOUND' WILL BE DISPLAYED.

d)DELETING ALL RECORDS FROM A SITE

i)From the MAIN MENU, use and to highlight the RECORD MGMT item.

ii)Press the 'ENTER' key. A menu named RECORD MGMT will be displayed.

iii) From the RECORD MGMT menu, use and to highlight the DELETE ALL RECORDS item.

iv)Press the 'ENTER' key. A message as
be displayed.

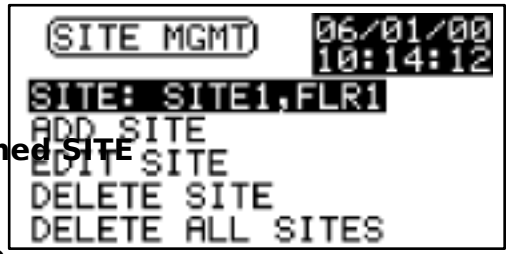
v)Press the 'ENTER' key again. A secon
'RECORD(S) DELETED,' is then displa
to acknowledge the deletion of the r

vi)Press 'PREV' once to move back to the MAIN MENU.

NOTE:IF THERE ARE NO RECORDS STORED UNDER THE CURRENT SITE, THE MESSAGE 'NO RECORDS FOUND' WILL BE DISPLAYED.

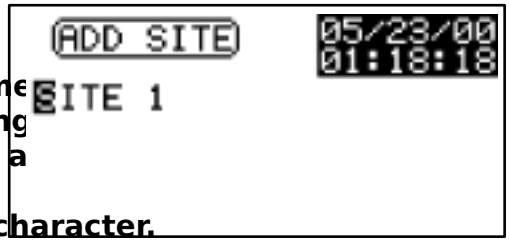
e)ADDING SITES

i)From the MAIN MENU, use and to
highlight the SITE MGMT item.



ii)Press the 'ENTER' key. A menu named SITE
MGMT will be displayed as shown.

iii)From the SITE MGMT menu, use and to
highlight ADD SITE.



iv)Press the 'ENTER' key. A menu name
SITE will be displayed with a blinking
the first character of the site name a

v)Use the and to change the blinking character.

vi) Use the ← or → to move to each character of the site name. Up to 12 characters ca

vii) Once the site name is changed to a desired name, press the 'ENTER' key. The menu will then be displayed.

viii) Press the 'PREV' key to move back to the MAIN MENU.

NOTE: UP TO 20 SITES CAN BE ADDED TO THE SYSTEM. IF AN ATTEMPT TO ADD ADDITIONAL SITES IS MADE, THE MESSAGE 'CAN NOT ADD ANY MORE SITES' WILL BE DISPLAYED.

f) NAMING CONVENTIONS FOR SITE NAME: The site name should contain a couple of items that distinguish in detail one site name from another. A site name should building name, customer name or closet name along with a second name such as room number. The floor number and/or room number will change more frequent most cases, the building name, customer name or closet name remains the same Remember that the site name can only be 12 characters or less. Here are a few names and explanation for each.

i) ITC/FLOOR1 - This site name can be used if the number of jacks on floor 1 is 100 Remember that the Programmable Terminator is used to identify each cable wi 99. So if floor 1 contains 100 jacks or less, each jack can have its own Termina distinguishing it from others. The site of testing is floor 1 of Independent Tech

ii) ITC/2100 - This site name should be used if any floor in the building contains mor jacks. 2100 is the start of a series of jacks numbered between 2100 and 2199. Programmable Terminator can be set for the last two digits of the jack. The sit floor 2 of Independent Technologies, Inc.

iii) CLOSET1/FLR1 - If a building has multiple closets, CLOSET may be used in the site Here, the site of testing is closet 1 of floor 1.

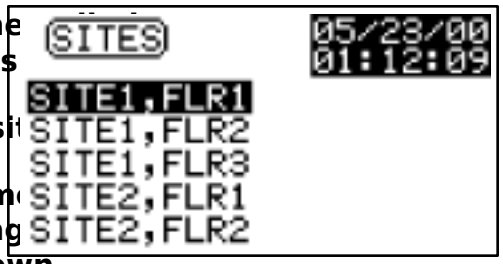
g) EDITING A SITE NAME

i) From the MAIN MENU, use ↑ and ↓ to highlight the SITE MGMT item.

ii) Press the 'ENTER' key. A menu named SITE MGMT will be displayed.

iii) From the SITE MGMT menu, use ↑ and ↓ to highlight EDIT SITE.

iv) Press the 'ENTER' key. The SITES me
all stored sites will be displayed as s



v) Use the ↑ and ↓ to highlight the desired si

vi) Press the 'ENTER' key. A menu nam
SITE will be displayed with a blinking
the first character of the site as shown.

vii) Use the ↑ and ↓ to change the blinking ch

viii) Use the ← or → to move to each characte
site name. Up to 12 characters can b

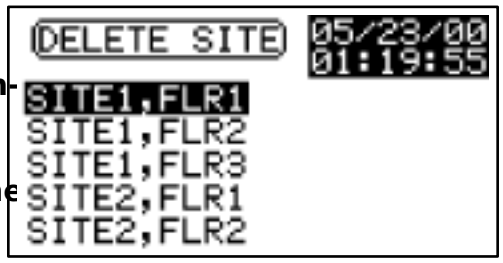
ix) Once changed to a desired site, pres
key. The SITES menu will then be displayed.

x) Press the 'PREV' key twice to move back to the MAIN MENU.

NOTE: ADDING AND EDITING SITE NAMES CAN BE DONE MORE QUICKLY USING THE DATA MANAGER.

h) DELETING A SITE AND ITS RECORDS

i) From the MAIN MENU, use the ↑ and ↓ to high-
light the SITE MGMT item.



ii) Press the 'ENTER' key. A menu name
MGMT will be displayed.

iii) From the SITE MGMT menu, use the ↑ and ↓ to
highlight the DELETE SITE item.

iv) Press the 'ENTER' key. A menu name
SITE will be displayed as shown.

v) Use the ↑ and ↓ to highlight the desired si

vi) Press the 'ENTER' key. A message as shown will be displayed; warning that all
also be deleted for that site.

vii) Press the 'ENTER' key again. The message 'SITE(S) DELETED' will be displayed
edging the deletion of the site and its records. The DELETE SITE menu will the

i) Press the 'PREV' key twice to move back to the MAIN MENU.

i) DELETING ALL SITES AND RECORDS

i) From the MAIN MENU, use ↑ and ↓ to highlight the SITE MGMT item.

ii) Press the 'ENTER' key. A menu named SITE MGMT will be displayed.

iii) From the SITE MGMT menu, use ↑ and ↓ to highlight the DELETE ALL SITES item.

iv) Press the 'ENTER' key. A message as shown will be displayed warning that all sites will be deleted.

v) Press the 'ENTER' key again. The me
'SITE(S) DELETED' will be displayed
acknowledging the deletion of all sit
The SITE MGMT menu will then be di

vi) Press the 'PREV' key to move back t
MENU.

j) BATTERY OPERATION AND REPLACEMENT The TEST-ALL IV+ Plus® constantly monitors its power source during operation. When the battery strength decreases to level, a 'LOW BATTERY' message will be displayed briefly. Although the TEST-ALL IV+ Plus® will continue to operate in a low battery condition, it is recommended that all th be replaced as soon as possible. The following are instructions for battery repla

i) Remove the battery door on the back of the case, using a flathead screwdriver.

ii) Pull up on the nylon strap to remove the battery carrier from the case.

iii) Unplug the battery carrier.

iv) Replace the batteries and reinstall the battery carrier. (9-Volt Duracell batteri

NOTE: THE USE OF THE AC ADAPTER TO POWER THE TEST-ALL IV+ Plus® IS RECOMMENDED TO PROLONG BATTERY LIFE. USE ONLY THE AC ADAPTER SUPPLIED WITH THE TEST-ALL IV+ Plus® KIT.

k) MEMORY BACKUP BATTERY If the warning 'MEMORY BACKUP BATTERY LOW' is displayed on power-up, perform the following.

i) Leave the unit powered up until the following step is completed.

ii) Upload any stored records to the Data Manager, if not previously performed.

iii) Go to the CUSTOMER SERVICE INFORMATION section in this manual for informa sending the unit in for repair.

NOTE: DO NOT STORE ANY MORE TESTS IN THIS CONDITION. THE MEMORY IS NOT RELIABLE AND THE TESTS CAN BE PERMANENTLY LOST.

8. THE TEST-ALL IV® +Plus Data Manager - Disconnect any cable under test Prior to Plugging the Serial Cable from the PC.

a) INSTALLATION OF THE Data Manager - This installation is for users of Windows 95 or newer using the floppy disks provided with the kit.

i) Insert disk 1 of 2 into floppy drive.

ii) Choose Start on your windows desktop, then select run.

iii) Type x:\setup, substituting your floppy drive letter for x. Follow the instructio

b) HOW TO RUN THE Data Manager:

i) After installing the TEST-ALL IV® +Plus Data Manager, click on the icon labeled TEST-ALL IV ® +Plus Data Manager to run it. By default the icon is located in the Start\Programs\Independent Technologies menu.

ii) Additional information regarding how to use the TEST-ALL IV® +Plus Data Manager is located in the help\help topics menu.

NOTE: ALL OR MOST CHANGES, ADDITIONS, AND EDITS TO SITENAMES, OWNER NAME, ETC. CAN BE MADE USING THE DATA MANAGER WHILE THE TEST SET IS CONNECTED TO THE PC.

c) UPLOADING TEST RESULTS TO THE Data Manager

i) The TEST-ALL IV® +Plus can be in any screen to perform the uploading, but the M MENU or TEST SETUP screens are preferred.

ii) Plug in the 9-pin serial cable coming from the PC.

iii) In the TEST-ALL IV® +Plus Data Manager, select Upload Records from the Communica- tions menu.

iv) A window on the PC will display a message while performing the upload.

v) Verify the records were uploaded into the TEST-ALL IV® +Plus Data Manager.

vi) Once verified, it's recommended that all stored records be deleted from the TE
+Plus to increase available record storage.

d) DOWNLOADING UPDGRADES FROM THE ITC WEBSITE: The TEST-ALL IV® +Plus
Data Manager (PC Software) and TEST-ALL IV® +Plus (Test Set Software for both original
and TDR versions) can be downloaded from the ITC website using the following

i) A password will be needed to perform any download from the ITC website. To r
password, call your ITC sales contact at (402) 496-4700.

ii) Log on to the Internet and go to the URL, http://www.IndependentTech.com/.

iii) Click on the menu selection "Customers Only".

iv) A page will load listing several Private Page options. Choose the ITC Customer
Pages, and that page should load.

v) When requested for ID and Password, enter "independent" for the ID, and ente
by sales (be sure to use lower case). If the password is rejected, call your sale

vi) When the private page loads, Double Click on the download selection you want
are download selections for the TEST-ALL IV® +Plus.

- Download TEST-ALL IV® +Plus Data Manager (PC Software, .EXE file)
- Download TEST-ALL IV® +Plus with TDR (Test Set Software with TDR feature
- Download TEST-ALL IV® +Plus (Original Test Set Software, .ZIP file)

vii) The .EXE or .ZIP file should then be downloaded to the file/folder you specify. T
must be unzipped in order to perform an upgrade of the Test Set Software. Kee
files in case they are needed again.

e) UPGRADING THE TEST-ALL IV® +Plus

i) With the TEST-ALL IV® +Plus off, press the 'ON/OFF' key while holding the 'ENTER' a
keys. This will power the TEST-ALL IV® +Plus and place it in a mode for upgrading the op
system. The message, 'WAITING FOR DOWNLOAD,' will be displayed on the TE® +Plus.

ii) Plug in the 9-pin serial cable coming from the PC.

iii) In the TEST-ALL IV® +Plus Data Manager, select TEST-ALL IV® +Plus Maintenance from
the Communications menu.

iv) In the TEST-ALL IV® +Plus Maintenance window, click on the 'Download Firmware
button. A window will be displayed requesting the file to download.

v) Select the .hex file that was downloaded from the Independent Technologies w

vi) A window on the PC will display a message while performing the download. Th
'DOWNLOADING FIRMWARE...' will also be displayed on the TEST-ALL IV® +Plus.

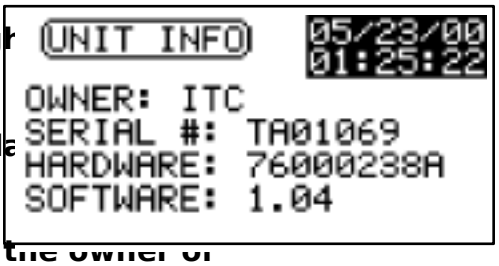
vii) The message, 'DOWNLOADING SUCCESSFUL!' will be displayed on the TEST-ALL® IV +Plus, once the upgrade is complete.

viii) The TEST-ALL IV® +Plus will then automatically run the new operating system.

NOTE: THE ACTUAL TIME TO DOWNLOAD A NEW OPERATING SYSTEM WILL TAKE OVER 1 MINUTE. NOTICE THAT THE SOFTWARE VERSION IN THE UNIT INFO SCREEN CHANGED AFTER THE UPGRADE IS COMPLETE.

9. ABOUT THE TEST-ALL IV® +Plus: The UNIT INFO screen displays information about the TE ALL IV® +Plus, which must be supplied to tech support if tech support is needed. T screen can be accessed as follows, with an explanation of each item in detail.

a) From the MAIN MENU, use the ↑ and ↓ keys to highlight the UNIT INFO item.



b) Press the 'ENTER' key. A screen, simila shown, will be displayed.

c) The item, OWNER, can be changed by the owner of the TEST-ALL IV® +Plus within the TEST-ALL IV® +Plus Data Manager as follows:

i) Plug the 9-pin serial cable from the PC into the TEST-ALL IV® +Plus.

ii) Select TEST-ALL IV® +Plus Maintenance from the Communications menu in the TE ALL IV® +Plus Data Manager.

iii) Click on the 'Change...' button in the TEST-ALL IV® +Plus Information section.

iv) A window will be displayed allowing the user to enter a new owner name. Ente and click OK.

v) Notice the item, OWNER, in the UNIT INFO screen, shows the new name.

vi) The item, SERIAL#, is a tracking number.

vii) The HARDWARE is the current version of the hardware within the unit.

viii) The SOFTWARE is the current version of software within the unit. Notice that after an upgrade is complete.

ix) The SERIAL#, HARDWARE and SOFTWARE will all be requested by tech support assistance is needed. The owner of the unit can't change these items.

10. TEST-ALL IV® +Plus KIT INFORMATION (ITC-3402-TDR-KIT)

1 ea. ITC-3402-TDR TEST-ALL IV® +Plus Test Set
2 ea. ITC-3402E-TDR TEST-ALL IV® +Plus Programmable Terminator w/short 8 conductor CAT 5 cord
1 ea. ITC-3002A 8 Conductor CAT 5 long cord
1 ea. ITC-3002B 4 pr 110 Adapter
1 ea. ITC-3002C 4 pr 66 Adapter
4 ea. ITC-3234B1-1 9 Volt Battery
1 ea. ITC-3402AC AC Adapter
1 ea. ITC-3402M-TDR User's Manual
1 ea. ITC-3402G Soft Carrying Case
1 ea. ITC-3402-SW Windows Application Software Package
1 ea. ITC-3013 25 pr 110/7R45 Adapter

11. WARRANTY

Independent Technologies, Inc. warrants the TEST-ALL IV® +Plus against all defects in material and workmanship for a period of one full year from the date of original purchase subject conditions: Warranty does not cover accessory items, battery replacement, damage misuse or common carrier shipment damage. Damaged products should be returned paid, in the original package or equivalent. Defective units still under warranty will replaced at the manufacturer's option. Defective units not under warranty will be manufacturer's option for actual cost of repair, not to exceed 50% of current replac

Be sure to fill out the Warranty Card that accompanies the kit and return it to ITC a fill in the Serial # which is on a label under the flip out stand on the back of the tes Serial # can also be obtained by going into the "MAIN MENU" of the test set under INFO" sub-menu. Returning this card will guarantee Warranty coverage and will be when calling for a User Password for software upgrades from our Web Site.

TEST-ALL IV® +Plus DOES NOT CONTAIN ANY USER REPAIRABLE PARTS OTHER THAN THE BATTERY. THIS WARRANTY IS NULL AND VOID IF THE TESTER HAS BEEN DISASSEMBLED BEFORE RETURNING TO INDEPENDENT TECHNOLOGIES' FACTORY REPAIR CENTER.

12.CUSTOMER SERVICE INFORMATION

**For immediate technical assistance, call Independent Technologies' Technical Supp
(402) 496-4700.**

**Prior to returning any equipment for repair or calibration, please contact Independ
at (402) 496-4700 to obtain a Return Authorization Number (RTA). No shipment wi
without this RTA# on or in the package.**

Please forward all repairs to:Independent Technologies, Inc.
Repair Services Division
26 First Avenue SE
New London, MN 56273

13.ORDERING INFORMATION

TO ORDER, CONTACT ANY OF OUR SALES PERSONNEL AT (402) 496-4700.

INDEPENDENT TECHNOLOGIES, INC.
1960 Ridgeview Road
Blair, NE 68008

APPENDIX A: Specifications

GENERAL

Size: 10.75” x 7.5” x 2.25”

Weight: 2.54 lbs

Power: 3 – 9V Alkaline Batteries, 35 Hours Nominal,
AC Adapter 9V @ 300mA, positive (+) on tip,
negative(-) on outer sleeve

Display Resolution: 64x128

Serial Port: 19200 Baud, 8 Data Bits, No Parity, 1 Stop Bit

MEASUREMENTS

Continuity Tests

- Open Conductors
- Shorted Conductors
- Reversed Pairs
- Crossed Pairs
- Split Pairs

Length

- **Accuracy:** +/-2% or +/-3 feet, whichever is greater
- **Resolution:** 3 Feet (1 Meter) @ 61% NVP
- **Minimum Distance:** 3 Feet (1 Meter) @ 61% NVP
- **Maximum Distance:** 2000 Feet (610 Meters)

ENVIRONMENTAL

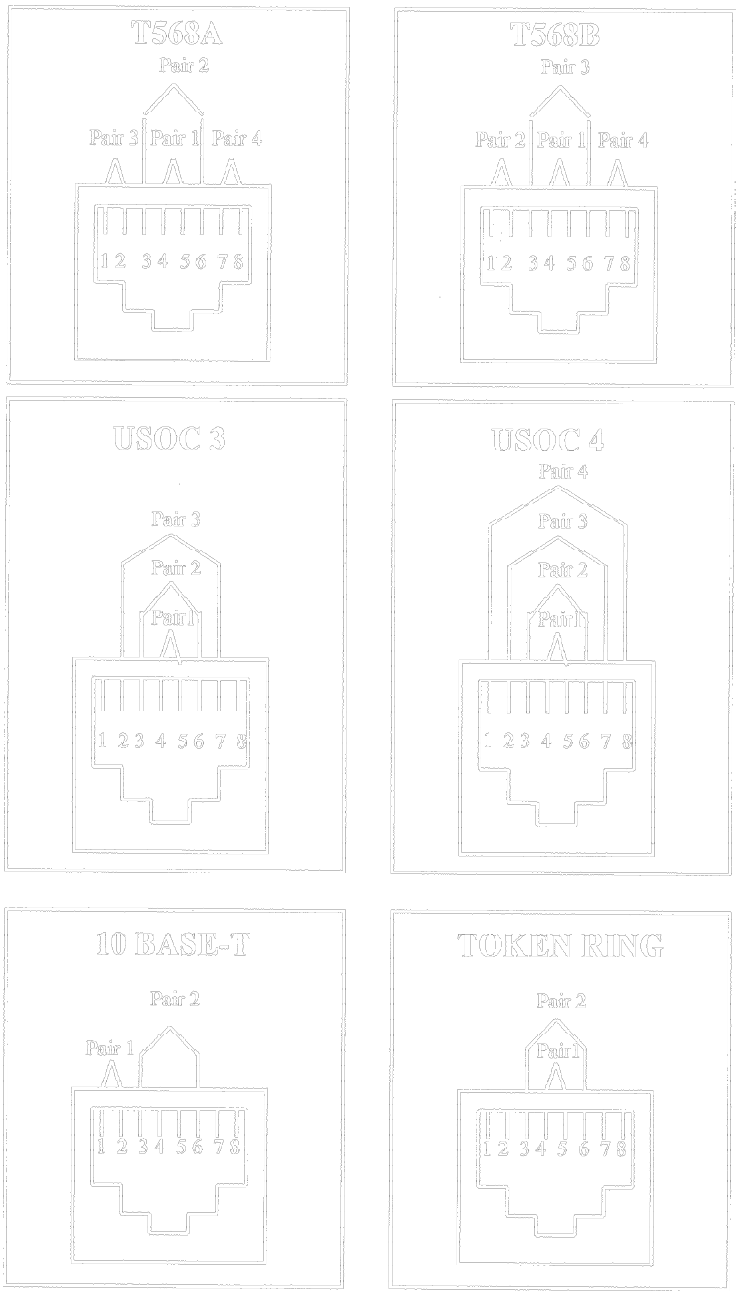
Operating Temperature Range: 32 – 122˚ F (0 – 50˚ C)

Storage Temperature Range: -4 – 168˚ F (-20 – 70˚ C)

Humidity: 5% – 95% Non-Condensing

Voltage Protection(RJ-45): Continuous Telco Voltages @ 100mA

APPENDIX B: Identified Wire Mappings



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